

*Exhibit 5*

**Kenneth Johnson**  
8301 11th Ave S  
Bloomington, MN 55420  
USA  
Phone (612) 866-0255

Application control # **08/856204**

February 19, 1999

Group 2800  
PTO Fax Center  
Crystal Plaza 4  
703- 308-7722  
Attn; A. Chang

Dear A. Chang,

Several times I have called your phone at 703-305-6208 but have receive a message stating that you were out. Therefore, I am faxing you this note.

I would like to discuss the final action on my **application 08/856204**. I need to know what changes in the claim you would like me to make.

Could you please call me at **612-866-0255** as soon as you have time. I would like to make the changes you are requiring to receive the allowance of my application.

This is my place of work. The phone will answer, Productive Enterprise / Nite Hawk. I will pick up the receiver.

Thank you for your help.

Sincerely,



Kenneth Johnson

PS. You may fax me at the same phone number 612-866-0255.

*Exhibit 6*

**Kenneth Johnson**

8301 11th Ave S  
Bloomington, MN 55420  
USA  
Phone (612) 866-0255  
Home Phone 854-3530

Application / control # 08/856204  
Art Unit 2872

Attn; Cassandra Spyrou  
Group 2800  
PTO Fax Center  
1-703-308-7722

Dear Cassandra Spyrou,

Last Friday I manage to contact the patent examiner who is assigned to my application. We were discussing whether or not, as an individual writting their own application, I had the right to request that the examiner write me a valid claim. The examiner said that she felt, "to do so was a conflict of interest".

As a guide in writting my application, I am using the book "Patent It Yourself." In the book the author states that as individual, it is my right to have the examiner write a valid claim for my application. The question is, "who the correct?", the examiner or the author.

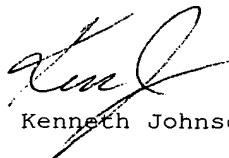
It is very difficult to write a claim when the examiner is evasive about their expectations.

Please respond to this inquire.

You may phone or fax me at 1-612-866-0255. This is my place of work so the phone answers, Productive Enterprise / Nite Hawk.

Thank you for your quick and diligent response.

Sincerely,



Kenneth Johnson

## The United States Patent and Trademark Office

Application Number; 08/856,204  
Application Date; 5/14/1997  
Applicant; Kenneth Edward Johnson  
Title; Slotted Peep  
Examiner; A. Chang  
Art Unit; 2872

### Continuation in Part

Assistant Commissioner for Patents  
Washington, District of Columbia 20231

Sir.

In response to the notice of allowance I respectfully ask the following be added to the above listed application.

Please add **figures 15, 16 and 17**.

Please add the **disruptions of figures 16, 17 and 18**.

Please add the following **reference numbers**.

- 48 wedge shaped closed end.
- 50 generally parallel sides of slots.
- 52 end point of slot.
- 54 second end point of slot.
- 56 aperture of slotted peep with wedge shaped closed end.
- 58 lines showing light being diffracted perpendicular to the edges.
- 60 thin inside edge of slots.

#### **Description of fig. 15, 16 and 17.**

Figure 15 shows four slots with wedge shaped closed ends 48. The four slots are joined at their end points 52 and 54. The perimeter of the aperture of the slotted peep is defined by the end point of the slots. The open end of the slots between points 52 and 54 create an edge of the aperture 56. Aperture 56 has virtually no material edge. Lines 58 show the direction light is diffracted by edges 48, and 50. Each closed end 48 directs the light diffraction caused by its edge away from aperture 56. Sides 50 direct the light diffraction along lines 58 parallel to aperture 56. All the light diffraction caused by the edges of each slot is confined to the slot. Aperture 56 will be free of diffraction.

Figure 16 shows an isometric view of figure 15.

Figure 17 shows a cross section view of the edges of sides 50 and 48. The inside edge 60 of side 50 and closed end 48 are made thinner than the main body of the slotted peep.

A slotted peep is composed of four or more slots.

The slots must be narrow enough to have both of its sides 50 diffract light passing through the slot simultaneously. I recommend a slot approximately 1mm in width and a length of approximately 2mm. The narrower the slot the more visible the diffraction.

## **Claims**

45. A slotted peep for viewing an object, comprising:

    A member having at least four slots formed therein;

    each of said slots having a pair of generally parallel sides extending a length between an open end and a closed end;

    each of said slots intersecting angularly spaced adjacent ones of said slots at said open ends thereof such that the open ends intersect to form corners and said intersection defines a central aperture;

    the closed ends of said slots being wedge shaped; and, the slots having the width thereof selected such that diffraction of light is confined to said slots and said central aperture is substantially free from light diffraction.

46. The slotted peep of claim 45, wherein

    each of said sides includes an edge and wherein the edges of said generally parallel sides and said closed end define a border of said slots; said member having a thickness adjacent to said border which is less than a thickness of said member away from said border.

47. The slotted peep of claim 46, wherein:

    said border defines a knife edge.

48. The slotted peep of claim 45, wherein:

    said slots are generally equi-angularly spaced.

49. The slotted peep of claim 45, wherein:

    the slots having the length at least twice the width thereof.

## Remarks

Claims 45 -47 were allowed as the result of an appeal. The appeal process did not allow for the amending of the application. This Continuation in Part is being filed so amendments can be submitted prior to the issuance of the patent. This has been discussed with the supervising examiner.

Because the slotted peep application has been allowed both 102 and 103 requirements have been met. Since the application is a *pro se case* I am requesting help with the wording of the new claims.

Claims 50 through 54 are similar to claims 45 through 47. Claims 45 through 47 have been allowed. The difference between the two sets of claims is the description of the closed end of the slotted peep. Claims 50 through 54 describe the closed end as being wedge shaped. Claims 45 through 47 describe the closed end of the slots as being curved. Both Mauro's and Russell's do not show or describe the wedge shaped closed end in their figures, description or claims.

The wedge shaped closed end is not taught by either Mauro or Russell. Both Mauro and Russell teach closed ends that are perpendicular to the parallel sides of their slots, and parallel to the perimeter of the aperture at the open ends of their slots. See Mauro's fig.1 and Russell's fig. 2. Also Mauro claims his sight to comprise two rectangles overlapping at right angles. Russell claims his sight to be cross shaped. As part of the previously allowed appeal it was demonstrated that the closed end of Mauro's sight diffracts light away from its aperture. This is because the closed end of Mauro's sight is parallel to the open end of Mauro's slots and the perimeter of Mauro's aperture. This is also true of Russell's sight. The wedge shaped closed end of the slot of a slotted peep is not parallel to the perimeter of the slotted peeps aperture or the open end of its slots. The slotted peep with wedge shaped closed ends is unique over both Mauro's and Russell's sights.

All patents are responsibility for full disclosure. Both Mauro and Russell fail to teach about light diffraction. Both Mauro and Russell fail to teach about reducing the thickness of the sight member at the edges of the slots. Both Mauro and Russell fail to teach using a wedge shaped closed end to direct light diffraction away from the aperture of their sights. Both Mauro and Russell show, describe, and claim closed ends that have been demonstrated to diffract light away from the apertures of their sights. The slotted peep with closed ends described as wedge shaped, is unique over both Mauro's and Russell's sights and meets the 102 requirement.

Exhibit 7 is from Physics Principles with Applications. This text is the most widely distributed physics text published. It will be found in every college and public library in the United States and is printed in every major language. On page 629 note figure (b) at the top of the page. Note the intersecting slots. They show a diffraction pattern that is continuous along the intersection of the slots. Also note line 4 of page 629. “A diffraction pattern exists around any shape object illuminated by a point source, as shown in fig. 24, 15(b). We are not always aware of them because most sources of light in everyday life are not points, so light from different parts of the source wash out the pattern.” Everyday light washes out the pattern but not the diffraction. This is the prevailing belief. This is the expected results.

The slotted peep claimed in claims 45 through 47 was found to meet the requirements of section 103 because it produced an unexpected result. The slotted peep claimed in claims 50 through 54 meets the requirements of section 103 for the same reason. Enclosed is a sample of the slotted peep with the wedge shaped closed end. Hold the small plate an inch in front of your nose and look through the center on the slotted peep cut in the plate. You will see a square hole. This hole will be clear. The diffraction is confined within the slots and does not effect the intersection of the slots as shown in fig. (b) from page 629 of Physics Principles with Applications. The diffraction is not continuous along the edge of the slots of the slotted peep with wedge shaped closed ends. Light is not being diffracted from the intersection of the slots of the slotted peep with wedge shaped closed ends. What is true of the slotted peep with the curved closed ends is true of the slotted peep with the wedge shaped closed ends. Both produce an unexpected result. Both meet the requirements of allowance under section 103.

## **Summary**

To avoid future disputes it is important that the wedge shaped closed end be claimed. Figures 9, 10, 11, and 12 of the slotted peep application show light being diffracted by the curved closed end. The wedge shaped closed ends in figures 15, and 16 are shown diffracting light in the same direction as the curved closed end. Both control light diffraction in a similar manner. The two shapes can be interchanged. The new claims should be allowed.

Both the slotted peep with the curved closed end and the wedge shaped closed end meet the requirements of both section 102 and section 103. Since the old claims describing a slotted peep with curved closed ends have been allowed, the new claims describing a slotted peep with wedge shaped closed end should also be allowed.

This being a Continuation in Part, claims 45 through 47 and claims 50 through 54 are allowed to be similar. The wedge shaped closed end, although similar to curved closed end, should be considered new material. Both sets of claims are proper and allowable.

The skills I have at writing claims are limited. Therefore the examiner's help is needed.

Under Section 707.07(j), of the Manual of Patent Examining Procedures, I request that the new claims be amended if necessary, to incorporate the wedge shaped closed end and meet the requirements of allowance.

If there are any questions or suggestions please telephone or fax me at 612 866-0255.

Very respectfully I submit the above Continuation in Part. Thank you.

P A T E N T

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

J. E. Johnson

No. : 08/856,204 Examiner: A. Chang  
: May 14, 1997 Group Art Unit: 2872  
: SLOTTED PEEP  
No. : 19363/101/101

DECLARATION OF DR. THOMAS N. TOMMET

Assistant Commissioner  
Patents  
Washington, D.C. 20231

CERTIFICATE UNDER 37 C.F.R. 1.8  
I hereby certify that this correspondence is being deposited with the  
United States Postal Service on the date shown below with sufficient  
postage as first class mail in an envelope addressed to the Assistant  
Commissioner for Patents, Washington, D.C. 20231 on this February 2001.  
By: 

, Dr. Thomas N. Tommet, hereby declare:

1. I am the Chairman of the Department of Physics at the University of St. Thomas in St. Paul, Minnesota. I have been a professor of Physics at the University/College of St. Thomas for twenty-one years. I am a graduate of the College of St. Thomas with an undergraduate degree in Chemistry and have earned a Masters Ph.D. in Physics from the University of Wisconsin at Madison.
2. My background, relevant to light diffraction includes the taking of many introductory and advanced undergraduate physics courses including such subject matter.

P A T E N T

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Kenneth E. Johnson

Serial No. : 08/856,204  
Filed : May 14, 1997  
For : SLOTTED PEEP  
Docket No. : 19363/101/101

Examiner: A. Chang

**DECLARATION OF DR. THOMAS N. TOMMET**

Assistant Commissioner  
for Patents  
Washington, D.C. 20231

CERTIFICATE UNDER 37 C.F.R. 1.8  
I hereby certify that this correspondence  
is being deposited with the United States  
Postal Service on the date shown below  
with sufficient postage as first class  
mail in an enveloped addressed to the  
Assistant Commissioner for Patents,  
Washington, D.C. 20231 on this \_\_\_\_\_ day of

By: \_\_\_\_\_

Sir:

I, Dr. Thomas N. Tommet, hereby declare:

1. I am the Chairman of the Department of Physics at the University of St. Thomas in St. Paul, Minnesota. I have been a Professor of Physics at the University/College of St. Thomas for twenty-one years. I am a graduate of the College of St. Thomas with an undergraduate degree in Chemistry and have earned a Masters and a Ph.D. in Physics from the University of Wisconsin at Madison.

2. My background, relevant to light diffraction includes the teaching of many introductory and advanced undergraduate physics courses including such subject matter.

3. I have reviewed the invention of Mr. Kenneth E. Johnson, the claims pending in the present application, and the prior art patents of Mr. Mauro (U.S. Patent Number 3,861,050) and Mr. Kendall (U.S. Patent Number 5,080,084.)

4. After review of these patents I believe Mr. Johnson's invention, as he has claimed it in the above referenced application, uses the properties of physics, specifically those relating to the diffraction of light, in a distinct way not utilized or conceived by the prior art inventors. In particular, Johnson's slotted peep provides a small aperture (peep) without diffraction, which the prior art devices do not exhibit, nor do the references raise this problem or this particular solution. Mr. Johnson has designed a peep sight that does not suffer from the problems of diffracted light. Diffraction is an interference phenomenon that is most noticeable in small apertures and narrow slits. Diffraction can cause significant problems in viewing, through small aperture and slit-type sights, due to the regions of destructive and constructive interference that appear as dark and bright regions within the viewing area of the sight. For example, a circular aperture produces a bull's eye pattern within the

viewing area, while a slit produces alternating dark and bright bands parallel to the slit.

5. In Mr. Johnson's application his peep design has a two slits (each slit comprises two of what Mr. Johnson refers to as slots) that overlap each other and are oriented to cross generally through their center points, wherein the overlap of these slits defines a center aperture. The center aperture is a "diffraction-free aperture". The narrow slits produce diffraction, but not in the overlap region. While looking through the slotted peep, I found that the center aperture was very clear while the rest of the slits are fuzzy due to the interference. This is not possible with the prior art devices, specifically because the length of the slits is not long enough to provide the desired elimination of diffraction.

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10

6. With regard to the patent to Mr. Mauro, as a first difference, the intent of Mr. Mauro and Mr. Johnson are different. Namely, Mr. Mauro's design is concerned with the attachment of the device to the barrel of the gun.

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7. Furthermore, the design of Mr. Mauro's device is distinct from Mr. Johnson's invention. In particular, the aspect ratio of length to width of the Mauro device is too short to accomplish the substantial elimination of diffraction in the overlapped region of

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the device. The aspect ration of length to width of the slits in the Mauro device is 2, while the minimum aspect ratio of length to width to achieve a diffraction-free aperture as provided by Mr. Johnson's device is 6, including the length of the curved end portions. This much larger aspect ratio allows this device to produce the result of having a smaller center aperture, allow for the precise targeting with the sight, while significantly reducing the amount of diffraction within the center aperture.

8. With regard to Mr. Kendall's patent, the patented device is primarily designed to make the aperture viewable to the viewer. This structure appears to be concerned about viewing from a angle with respect to the device and therefore the beveled edge of the aperture is necessary to not obstruct a portion of the aperture with the thickness of the wall. Mathematically, the apparent width of the aperture is only a fraction of the actual width of the aperture as the viewing angle with respect to the device increases. The equation used to calculate the apparent width is as follows:

$$\frac{w_a}{w} = (1 - R \cdot \tan \theta) \cdot \cos \theta$$

where w is the actual width of the aperture,

w<sub>a</sub> is the apparent width,

R is the aspect ratio of the thickness of the aperture to the

width of the aperture, and  
 $\theta$  is the angle between the line of sight and the  
perpendicular of the aperture.

9. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code, and that such willful, false statements may jeopardize the validity of the above application.

Respectfully submitted,

Date \_\_\_\_\_

Dr. Thomas N. Tommet  
Chairman of the Department of Physics,  
University of St. Thomas

**IN THE UNITED STATES PATENT  
AND TRADEMARK OFFICE**

**BEFORE THE BOARD OF APPEALS AND INTERFERENCES**

In Reapplication of: Kenneth Johnson

Serial No: 08/856,204

Application Filed: May 14, 1997

Application Title: Slotted Peep

Examiner/GAU; Audrey Chang, Art Unite 2872

**Appeal Brief**

**Real Party In Interest**

As the patent application is unassigned, the inventor, Kenneth Johnson, named above is the real party in interest.

Please excuse the errors in the form and format of the document. It is filed by someone with no training in the processing of an appeal brief. This is a *pro se case*.

Please examine it knowing, 37 CFR 1.192 (c) "The brief shall contain the following items under appropriate headings and in the order indicated below unless the brief is filed by an applicant who is not represented by a registered practitioner;" Thank you.

**Related Appeals And Interferences**

None.

**Status Of Claims**

All claims rejected.

**Status of Amendments**

October 15, 2001 an amendment was submitted after final rejection. The examiner refused to enter the amendment. This appeal is being pursued because the examiner refused to enter the amendment.

**Summary Of Invention**

**The slotted peep is based on two premises, light can diffract only if it passes an edge, and light diffracts perpendicular to the edge causing the diffraction. Therefore, all edges of the slotted peep are shaped to direct light parallel to or away from the aperture of the peep.**

**The slotted peep is made up of three or more slots.** Page 5 line 20, “A slotted peep consists of three or more slots similar to fig 5.” **The slots have two side edges, a curved closed edge, and an open end.** Page 5 line, The slots are arranged with point 36 of one slot coinciding with points 38 of the adjacent slot. Curved end 42 is the outermost side.” **A line drawn perpendicular to the end point of the side edges passes through both end points,** (see fig. 5, and page 5 line 16) “Fig. 4 shows a straight line 40 drawn perpendicular to side 32 and passing through end point 36. Line 40 will pass through end point 38.” **At least three slot are arranged around an open area so that the end points of the side edges of each slot coincides with the end point of the adjacent slot,** (page 5 line 21). “The slots are arranged with point 36 of one slot coinciding with point 38 of the adjacent slot.” **Light passing through the slots is diffracted perpendicular to edges 32 and 34, and parallel to the center aperture.** (page 5 line 32). “Fig. 10 illustrates how a slot 43 is able to confine the light diffraction within the slot. The diffracted light, lines 45, is diffracted perpendicular to the edges of sides 32, and 34. Sides 32, and 34 are perpendicular to the opening between points 36, and 38. The light is diffracted parallel to the opening between points 36, and 38. Sides 32, and 34 will not cause light to diffract above points 36, and 38.” Figures 10, 11, and 12 show line 45 diffracting perpendicular to edges 32, 34, and 42.

**The length of the side edges are important and should be at least approximately 2mm long.** Page 6 line 1, “The length of the slot prevents any light diffracted by the bottom edge 42 from affecting the space above points 36, and 38.” and page 7 line 5, “I recommend a length for sides 32, and 34 of approximately 2 mm.” **The width of the slots should be approximately 1mm.** Page 7 line 1, “I recommend a slot width of approximately 1mm.”

**The curved edge diffracts light away from the aperture.** Fig. 9 through 12, show the light diffraction 45 perpendicular to the curved edge and directed away from the aperture 44. The center of the curve is the outer most point and will not affect the aperture because it is an additional approximate 1/2 mm. from the open end of the slot. The curved edge can be shaped other then curved as long as it does not diffract light from the aperture. Page 6 line 26, “Side 42 need not be curved as long as its edge does not diffract light away from the slotted peep's aperture”. **For example side 42 could be a straight edge that is at approximately 135 degree angle to one of the side edges. But this is harder to manufacture.**

**All edges of the slotted peep are made as thin as practical.** Fig 13 shows the thin edge. Page 6 line 12, “Edge 46 should be as short as possible. Edge 46 being short reduces the amount of edge at points 36, and 38. The shortness of edge 46 also aids in the control and

confinement of the light diffracted by sides 32, 34, and 42.” **To create an aperture that has no edge the end point of the side edges must be as near to a point as possible. To do this the edges must be thin.** Page 5 line 22. “The perimeter of a slotted peep aperture is defined by the open ends of the slots. Each aperture is indicated by 44. The only physical objects near the perimeter of the aperture are points 36, and 38. These points have little or no edge. A slotted peep aperture has virtually no edges defining it.” Page 6 line 32, “A critical location of a slotted peep is where end points 36, and end points 38 coincide. This location provides the greatest opportunity for light to be diffracted away from the slotted peep's aperture. There may be an insignificant amount of light diffraction in the slotted peep's aperture. This most likely would be caused by the locations where points 36 and 38 coincide. I recommend the locations where points 36 and 38 coincide be sharp corners.”

**The slotted peep aperture can be made larger by increasing the number of slots that surround the aperture.** Page 6 Line 37, “number of the slots of a slotted peep can vary depending on the size of an aperture desired. The wider the slots and the greater the number of slots the larger the aperture.”

**The slotted peep should be made in a ridged material.** Page 7 line 6 “The slotted peep should be housed in a rigid material.”

**This is the preferred form of the slotted peep. Variations of this form will work well.** Page 6 line 26, “A slotted peep can be altered from the above description and still perform adequately. Side 42 need not be curved as long as its edge does not diffract light away from of the slotted peep's aperture. Sides 32, and 34 need not be straight or parallel as long as the edges of sides 32, and 34 do not diffract light away from the slotted peep's aperture.”

## **Issues**

Issue 1 Is the application patentable under 102?

Issue 2 Is the application unobvious under 103?

It is respectfully submitted that the answer to both questions must be an unequivocal “Yes!”

## **Grouping of Claims**

Claim 1 is grouped separate from all other claims because it was written *Pro se case*, and falls under Section 707.07(j). Therefore my argument is directed toward pointing out the patentable material in this application rather than the patentability of claim 1.

Section 707.07(j) states,

"When, during the examination of a pro se case, it becomes apparent to the examiner that there is patentable subject matter disclosed in the application (the examiner) shall draft one or more claims for the applicant and indicate in the office action that such claims would be allowed if incorporated in the application by amendment."

This practice will expedite prosecution and offer a service to individual inventors not represented by a registered patent attorney or agent.

Although this practice may be desirable and is permissible in any case where deemed appropriate by the examiner, it will be expected to be applied in all cases where it is apparent that the applicant is unfamiliar with the proper preparation and prosecution of patent applications.

Claim 1. Claim 1 written by Kenneth Johnson, Real Party In Interest.

1. A peep used to view objects or targets comprising:

- a. three or more slots,
- b. each said slot having one open end,
- c. said slots being shaped such that light diffraction is confined within said slots,
- d. said slots arranged around an open space with said open ends defining the perimeter of said open space, and
- e. said peep made in a rigid material,

whereby said peep's aperture will be free of shortcomings caused by diffracted light.

Claim 15

## Argument

**Claim 1, Issue 1** When I wrote the Slotted Peep Application I was aware of section 707.07(j). Being a *pro se case*, the examiner is obligated to write one or more claims that would be allowed if the examiner finds patentable subject matter disclosed in my application. To help point out the patentable material in the Slotted Peep Application, claim 1 (c) of the Slotted Peep Application states, " said slots being shaped such that light diffraction is confined within said slots,". Even though this claim is broad, it does describe the patentable material contained in the Slotted Peep Application. It is the shape of the slots that make the Slotted Peep unique, and patentable.

The problem is, the examiner refused to acknowledge that patentable material exist in the Slotted Peep Application. The examiner wrote, " Mauro teaches a sighting member (12) comprising a cut-out section (14) having more than three slots where one open end and the slots are arranged around the cut-out section that serves as an aperture or open space. The

**size of the cut-cut section, also inherently makes the sighting member free from the diffraction of light occurred at the edges of the section,( please see Figure 1-3 and the entire document). This reference therefore anticipates the claim.”**

The examiner states Mauro's Patent teaches the same about light diffraction as is taught in the Slotted Peep Application. This is false. The examiner's sweeping assumption that Mauro's Patent teaches about light diffraction is not supported anywhere in Mauro's patent or claim. Mauro's Patent has no mention of light or light diffraction. Also Mauro's Patent describes slots that are greatly different from the slots of the Slotted Peep Application. These differences are clearly described in the description and figures of the Slotted Peep Application. The Slotted Peep Application also includes a description of how its structure confines the diffraction caused by the edges of its slots, and prevent light from being diffracted from the aperture of the slotted peep. The examiner assumption has no foundation.

When you have completed reading these argument you will agree that the examiner made assumptions about Mauro's patent that are not supported anywhere.

Mauro teaches a Gun Sight, page 2 line 21, consisting of, “ the cut-out section being substantially cross shaped, being formed of two rectangles overlapping at right angles, the overlapping area common to both rectangles being approximately half of the area of each rectangle.” Figure 2 of Mauro's Gun Sight shows a gun sight having four non overlapping areas similar to the description in the above claim. The claim describes sides (A, the length of the side of the non overlapping area) as always one half the length of (B, the width of the non overlapping area). This must be true in order that, “the overlapping area common to both rectangles being approximately half of the area of each rectangle.” The geometry allows no other conclusion.

The Slotted Peep Application teaches that in order to confine diffracted light within a slot, the length of the side of the slot must be approximately twice the width of the slot. It teaches that to confine light diffraction within itself a slot must have a width of approximately 1mm and sides of approximately 2mm. Please refer to Fig 10 and page 6 line 1 of the Slotted Peep Application. “ The length of the slot prevents light diffracted by the bottom edge 42 from affecting the space above points 36, and 38.” Please refer to page 7 line 5 of the slotted peep application. “ I recommend a length for sides 32. and 34 of approximately 2 mm.” Also please refer to page 7 line 1. “ I recommend a slot width of approximately 1 mm.”

For a precise description of how the length of the side of the slots of the slotted peep confines diffraction I ask that you please refer to the description of fig. 10, page 5 line 32 of the Slotted Peep Application. “Fig. 10 shows a front view of the slot shown in fig. 9. Fig. 10 illustrates how a slot 43 is able to confine the light diffraction within the slot. The diffracted light, lines 45, is diffracted perpendicular to the edges of sides 32, and 34. Sides 32, and 34 are perpendicular to the opening between points 36, and 38. The light is diffracted parallel to

the opening between points 36, and 38. Sides 32, and 34 will not cause light to diffract above points 36, and 38. No light is diffracted vertically because the slot is open between points 36, and 38. There is no edge at the top of the slot between points 36, and 38 to cause light diffraction. The length of the slot prevents any light diffracted by the bottom edge 42 from affecting the space above points 36, and 38.”

Mauro teaches a slot width equal to twice the slot’s length. This slot is too short in comparison with the size of its overlapping area, (aperture), to confine the diffraction caused by the slot’s edges within the slots. This is one of the way the Slotted Peep Application is unique over Mauro’s Gun Sight.

The second obvious difference between what is taught by Mauro’s Gun Sight and what is taught by the Slotted Peep Application is the shape of the closed end of the slots.

Mauro teaches a Gun Sight, page 2 line 21, consisting of, “the cut-out section being substantially cross shaped, being formed of two rectangles overlapping at right angles.” A rectangle is a four sided figure in which all sides are straight lines and all corners are 90 degrees. Mauro’s Gun Sight has no curved edges and no angles greater or less than 90 degrees. Thus the closed end of Mauro’s slots are straight lines that are parallel to the open end of the slots. Since light diffracts perpendicular to the edge that causes the diffraction, the closed end of Mauro’s slot will diffract light from the overlapping area (aperture). Therefore the structure of Mauro’s Gun sight can not confine diffraction within its slots.

Figures 5, 6, 7, 8, 9, 10, 11, and 12 of the Slotted Peep Application shows slots that have a closed ends 42 that are curved. Figures 10, 11, and 12 show light diffraction directed perpendicular to the curved edge and away from the open end of the slots and away from the aperture of the slotted peep.

The closed end of the Slotted Peep Application’s slots being curved also increases the length of the slots. This further reducing the opportunity for the closed end of the slot to diffract light beyond the open end of the slot and away from the aperture of the slotted peep.

Another structural difference between Mauro’s Gun Sight and the Slotted Peep Application that aids the slotted peep in confining light diffraction within its slots, is the thin edge. Note Figure 13 of the Slotted Peep Application. Page 6 line 11 of the Slotted Peep Application states, “Fig. 13 is a cross section view of the edge of the sides 32, 34, and 42. Line 46 represents the width of the edge of sides 32, 34, and 42. Edge 46 should be as short as practical. Edge 46 being short reduces the amount of edge at points 36, and 38. The shortness of edge 46 also aids in the control and confinement of the light diffracted by sides 32, 34, and 42.” The word practical meaning, “Pertaining to actual use and experience rather than theory.” Thus the edge should not be so thin that it would be sharp enough to cut or too weak to be useful.

Mauro’s Gun Sight’s claim makes no reference to the edge of its slots, but figure 1 shows a wide edge that is the same thickness of the gun sight housing. No attempt is made to

describe a reduce the thickness of the gun sights edge. This thick edge will greatly increase the amount of edge at the corners of the overlapping area (aperture) and will greatly increase the amount of light diffracted from the overlapping area (aperture). This structure is the opposite of the Slotted Peep Structure.

Still another significant difference between the structure of Mauro's Gun Sight and the Slotted Peep is how large aperture are structured. Even though one of the objectives of the Slotted Peep Application is the provide a small aperture it also can provide larger apertures.

For example, if you wished to create an aperture that is 5 square mm. Mauro's Gun Sight would be two over lapping rectangles 2.25mm by 5mm. Its aperture would be a square 2.25mm by 2.25mm. it would be shaped like the Gun Sight's figure 1.

A Slotted Peep with a 5 square mm. aperture would look like Slotted Peeps Application's figure 8. It would have eight slots approximately 1mm wide. Page 6, line 37, states, " The width and number of slots of the slotted peep can vary depending on the size of an aperture desired. The wider the slots and the greater the number of slots, the larger the aperture. I recommend a slot width of approximately 1 mm."

Included in this appeal are two small plates. These plates are made of aluminum and painted so they do not shine. In the plate marked "Mauro's Gun Sight" are two cut outs that match the description of Mauro's Gun Sights. The other plate marked "Slotted Peep", contains two cut outs that match the description of the Slotted Peep. The aperture sizes in both plates are the same.

If you hold the plate marked, "Mauro" an inch in front of your nose and look through the cut outs you will see that the cut outs appear round. This is caused by light being diffracted away from its aperture. This is described in exhibit 7, taken form, Phyics Principles and Application, the worlds most widely distributed phyics textbook. Page 629, Figures (b), show how intersecting slots diffract light along their intire edge. The same diffraction occurs along the intire edge of Mauro's cut out. Page 629 line 4 "A diffraction pattern exist around any shape object illuminated by a point source, as shown in figs. 24-15b and c. We are not always aware of them because most sources of light in everyday life are not points, so light from different parts of the source washes out the pattern." Because your light source is varied the pattern of the diffraction is washed out, but the diffraction is visable and appears as a fuz along the entire cut out. Because the cut out described in Mauro's patent can not confine diffraction with in its slots, the diffraction causes the square hole in Mauro's Gun Sight to appear round.

If you hold the plate marked "Slotted Peep", an inch in front of your nose and look through the cut out, you will see a square hole that is brighter then the slots. That is because the diffraction is confined to the slots and all the light entering the square aperture passes through with out being diffracted. The Slotted Peeps aperture performs as is discribed in the Slotted Peep Application and is free of diffraction.

When you perform this procedure in dim light, Mauro's Gun Sight will become dimmer and appear smaller. Since Mauro's Gun Sight does not confine light diffraction within its slots, its aperture will appear smaller and dimmer. In dim light the intensity of the diffraction increases. This reduces the intensity of the light passing through Mauro's Gun Sight. Page 2 line 35 of the Slotted Peep Application, "Light diffraction also reduces the intensity of the light passing through current peep apertures," including Mauro's Gun Sight."

In dim light the square aperture of the Slotted Peep will be unchanged. The slots will appear opaque because as the diffraction within the slots increases. But the slotted peep's aperture will remain clear.

This is verified by Dr. Tommet, Chairman of the Physics Department at St. Thomas University. Dr. Tommet's affidavit is enclosed. exhibit 3 page 2 Lines 8-17.

By not considering claim 1, (c), the examiner ignored what makes the Slotted Peep Application unique over Mauro's patent.

In an effort to correct this error I telephoned the examiner, several times but received no response. Then I faxed the examiner, (exhibit 5), still no response. Again I telephoned and reached the examiner. The examiner refused to discuss the Slotted Peep Application. I then faxed the examiner's supervisor, (exhibit 6). The supervisor was willing to discuss the Slotted Peep Application. The supervisor reviewed the Slotted Peep Application and stated that it contained patentable material because of the rounded ends of the slots. The supervisor said she would discuss this with the examiner.

When I called the examiner again. The examiner said the supervisor had discussed the application with her. When I asked if she would write a claim that would allow the application the examiner said that, "I am the examiner and I will do as I choose."

In an effort to resolve this situation I reapplied pointing out the above differences between Mauro's Gun Sight and the Slotted Peep Application.

The reapplication was rejected for not being convincing.

Section 707.07(j), claim 1, and the observations of the supervisor had been completely ignored by the examiner.

It is still reasonable for me to request that a valid claim be written so the Slotted Peep Application can be allowed. I am a *pro se case* and it has been proven that there is patentable material in the Slotted Peep Application.

## **Claim 15 Issue 1**

All figures and pages in this argument are taken from the Slotted Peep Application unless otherwise stated.

15. A slotted peep, for use to view objects or targets comprising;

a) a housing having at least three slots formed therein, each of said at least three slots having an open end and a closed edge connected by a pair of side edges, said at least three slots are arranged relative to each other such that a central aperture is defined by interconnection of said open ends of said at least three slots; and

b) means to confine diffraction of light passing through said slots whereby said central aperture is relatively free of diffracted light.

a) This is supported by page 5 lines 20-25 and figures 6, 7, 8, 8, 10, 11, and 12.

b) This is supported by page 5 lines 26-37 and page 6 lines 1-2. Figures 9, 10, 11, and 12.

The slotted peep described in the figures of the slotted peep application is what I feel to be the best form of the slotted peep. It is not the only form.

Also, the slotted peep aperture does what no other aperture can. This is supported by exhibit 7 which is taken from, "Physics Principles and Applications", the most widely distributed college physics text in the world. So what is written in this text can be accepted as a world standard. Figure (b) on page 629 of this text shows two locations where slots intersect. The intersection of those slots is shown to diffract light. Page 629 line 4-8, "**A diffraction pattern exist around any shape object** illuminated by a point source, as shown in figs. 24-15 b and c. We are not always aware of them because most sources of light in everyday life are not points, so light from different parts of the source washes out the pattern." The exception theory is that diffraction exists around any shape object. **The plate marked "Slotted Peep" demonstrates the slots described in the slotted peep application do not diffract light at the end points where the slots coincide. Therefore it proves, diffraction does not exist around any shape object.** This again is confirmed by Dr. Tommet's affidavit, exhibit 3, page 2 line 15 and page 3 lines 3-9. The slotted peep does something never believed possible. Therefore the scope of this claim should be allowed to be as broad as possible.

16. The slotted peep of claim 15, wherein said means to confine diffraction of light further comprises forming said edges as thin as practical causing light passing therethrough to diffract perpendicularly to all said edges. This is supported in figure 13 and page 6 line 11-14. This structural difference between Mauro's Gun Sight and the Slotted Peep makes the Slotted Peep patentable.

17. The slotted peep of claim 16, wherein said side edges further comprise formation of sharp corners such that diffracted light is directed away from said central aperture leaving said central aperture relatively free of diffracted light. This is supported on page 6 line 12-14 and page 6 lines 32-36. This structural difference between Mauro's Gun Sight and the Slotted Peep makes the Slotted Peep patentable.

18. The slotted peep of claim 17, wherein said housing is of ridged construction. This is supported on page 7 line 6.

19. The slotted peep of claim 17, wherein said at least three slots further comprise any geometric shape such that any diffracted light is directed away from said central aperture. This is supported on page 6 line 26-31.

20. The slotted peep of claim 19, wherein said closed edge of said at least three slots is curved.

This is supported on page 5 line 18 and figures 1, 4, 5, 6, 7, 8, 9, 10, 11, 12. This structural difference between Mauro's Gun Sight and the Slotted Peep makes the Slotted Peep patentable.

21. The slotted peep of claim 17, wherein said central aperture, has no physical edge to cause light to diffract.

This is supported on page 5 line 23.

22. The slotted peep of claim 21, wherein each of said at least three slots is provided of a length to prevent any light diffracted by said closed edge of said slot from affecting the space above said series of paired points.

This is supported on page 6 line 1. Also exhibit 3, Dr, Tommet's Affidavit page 3 line 9-14. This structural difference between Mauro's Gun Sight and the Slotted Peep makes the Slotted Peep patentable.

23. The slotted peep of claim 22, wherein said slotted peep performs under all light conditions.

This is supported on page 7 line 21.

24. The slotted peep of claim 22 wherein providing greater number of slots enlarges said central aperture.

This is supported on page 6 line 37 and figures 6, 7, and 8.

25. The slotted peep of claim 22, wherein providing said at least three slots of greater width enlarges said central aperture.

This is supported on page 6 line 37.

## **Claim 1 Issue 2**

Under the headings Claim 1 issue 1 and Claim 12 issue 1, it is shown that the Slotted Peep Application teaches something never believed possible, that an edge can be structured where diffraction does not occur around its entire shape. The result of being able to control and confine diffraction, is the creation of an aperture that is free of diffracted light. This is an unexpected result. Proof the patentable material in the Slotted Peep Application is not obvious.

Please refer to Exhibit 7 Page 629 taken from "Physics Principles and Applications." This college text is the most widely distributed Physics text in the world. And can be found in nearly every public and college library in the United States. It represents the prevailing understanding and theory concerning light diffraction. Again looking at figure (b) the razor blade. All edges both inside and out are diffracting light and show a diffraction pattern extending out from the edges. The diffraction shown on the inside and the outside of the razor blade is continuous. No part of the edge is free of diffraction. Also the diffraction is uniform. At a given distance from the edge of the inside of the razor blade, the diffraction pattern shows a uniform intensity. Line 5 of page 629 confirms what is shown in figure (b), "A diffraction pattern exist around any shape object,". "Any," means "All,". **The prevailing theory taught in the world today is that, "All edges diffract light continuously along side edges."** Therefore if any edge of any shape is made, that dose not diffract light in a continuous pattern along its entire edge, we would say that said edge produced an unexpected result.

Please take the small plate marked, "Gun Sight," Holding the plate an inch in front of your nose, look through one of the holes in the plate at an object about ten feet away. You will notice that the inside of the hole appears fuzzy. And the shape of the hole does not appear square, it appears round. This is because there is light being diffracted continuously along the entire edge of the hole. This the what you would expect. This is what is taught though out the world. This is the expected result.

Please take out the small plate marked "Slotted Peep." Holding the plate an inch in front of your nose, look through one of the holes in the plate at an object about ten feet away. You will notice that the slots appear smaller and dimmer. This is the result of diffraction caused by the edges of the slots. You will also notice that the intersection of the slots, the aperture of the slotted peep, remains clear. There is no indication of light being diffracted from its aperture. The diffraction is not continuous along the edge of the cut out of the slotted peep. This is the unexpected result. There is nothing obvious in the Slotted Peep Application. A 103 rejection is invalid.

This is the assumption the examiner made when she refused to acknowledge that there is patentable material in the Slotted Peep Application. This assumption was based on the prevailing theory that "**All edges diffract light continuously along side edges.**" The refusal by the examiner is additional proof that the structure described in the Slotted Peep Application produces unexpected result.

Please refer to Dr. Tommet's affidavit, page 2 line 16 - 22. "Diffraction is an interference phenomenon that is most noticeable in small apertures and narrow slits. Diffraction can cause significant problems in viewing through small apertures and slit type sights, due to

the regions of destructive (dark) and constructive (light) interference that appears as dark and bright regions within the viewing area." This describes the picture of the razor blade and the holes in the plate marked "Mauro's Gun Sight." This is the expected results.

Please refer to Dr. Tommet's affidavit, page 2 line 15, "Mr. Johnson has designed a peep sight that does not suffer from the problem of diffracted light." Dr. Tommet confirms the slotted peep produces unexpected result.

Please look at Exhibit 10. This is an evaluation of the Nite Hawk Peep Sight, the commercial version of the slotted peep. This evaluation was published in "Archery Magazine," the official magazine of the "National Field Archery Association" and the "International Field Archery Association." They make up the world's largest archery organization. The author, Norm Mallonee is a member of the "California Archery Hall of Fame," an archery coach, owner of an archery retail shop, and has written for "Archery Magazine" for over ten years. He is held in highly regard by the three million archers in the United States. Norm is considered an expert on archery equipment including peep sights. Norm writes, line 2, "all I knew was, at dawn or dusk, - there wasn't enough light passing through my peep sight. I knew enlarging the peep wasn't the answer. It might bring in more light, but it lead to inconsistent shooting." This is Norm's expectations. The unexpected results are, line 6, "By controlling diffracted light, the Nite Hawk Peep has solved this problem."

There is another argument that proves the structure described in the Slotted Peep Application is not obvious. This argument is both valid and convincing. The slotted peep is the solution to a previously unsolved problem. Referring back the quotations from Norm Mallonee's evaluation, line 1-7, "Until I read Ken Johnson's article on diffracted light - all I knew was, at dawn or dusk - there wasn't enough light passing through my peep sight." The problem is not enough light passing through his peep sight. The old solution, "enlarging the peep," This creates a problem, "inconsistent shooting." Enlarging the peep has not been the solution because it created inconsistent shooting. Norm states the Nite Hawk Peep provides the solution to a previously unsolved problems of both not enough light passing through my peep sight and inconsistent shooting. "By controlling diffracted light, the Nite Hawk Peep (slotted peep) has solved the problem." This is reaffirmed on page 1 lines 56-59. "Sometimes we accept what is given us, because that's the way it has always been. Then someone comes up with a new idea that is worth trying. The Nite Hawk Peep is definitely worth trying." This is unsolicited testimony.

Exhibit 12 is another evaluation. This is a very short evaluation, written by David Dolbee, writer for, "Petersons Bowhunting," the most popular bowhunting magazine in the world. Distributing around 200,000 copies per issue. David also is an archer and coaches archery at U.C.L.A. Like Norm's evaluation it describes the slotted peep as the solution to a previously unsolved problem. Problem is "The center of a round-holed peep(the most widely used peep sight) is affected by changes in the light's direction and intensity." Round holed peeps have an inside edge that diffracts light along its entire edge, the same as Mauro' Gun Sight. Changes in light's direction and intensity effects the intensity of this diffraction. Therefore the shape and size of the round peep hole, changes, and the center of the peep hole changes, this includes Mauro's Gun Sight. The solution to this problem is the control of diffraction. "The Nite Hawk controls the diffraction, making the aim point (center of peep) constant for consistent aiming." Again this is unsolicited testimony.

Exhibit 13 is an article that was published in the, "African Bowhunter." It was after its publication that I received an email from someone interested in the Nite Hawk Peep. This person told me of the article and I emailed the publisher for a copy. Again this is unsolicited testimony. Paragraph one describes the previously unsolved problem, inconsistent shooting.

Paragraphs 2 and 3 describe the cause of the problem, diffraction. Paragraph 5 describes the solution, the control of diffraction provided by the Nite Hawk Peep (slotted peep). Looking through a Nite Hawk Peep, "The shooter sees a square that is perfectly clear. The light entering the square hole passes through undiffracted providing a square hole that remains free of any diffraction or distortion." This testifies that the slotted peep is the solution to a previously unsolved problem.

Exhibit 14 is an evaluation published in the "Oregon Bowhunter." It is an unsolicited testimony. It testifies that the Nite Hawk Peep (slotted peep) is the solution to a previously unsolved problem. The unsolved problem is, line 8, "Previously all peep sights distorted the light passing through their peephole." The solution, line 46, The Nite Hawk Peep (slotted peep) - creates a square hole that is free of diffraction. - The square always remains the same because it is free of diffracted (distorted) light."

In the Bible Christ state, John 5-31, "*If I testify on my own behalf, what I say is not accepted as real proof. But there is someone else who testifies on my behalf, and I know what he says is true.*"

Above there are six who have testified that what is stated in this appeal and what is stated in the slotted Peep Application is true. None have a commercial interest in this application. Also you have be able to witness the difference between the Slotted Peep and Mauro's Gun Sight.

This proved that the Slotted Peep Application has passes the test of the 102 and the 103. Therefore the examiner is obligated to write a claim and to approve this application. I ask that you direct the examiner, the examiner's supervisor or a third party to do so. Please enforce section 707.07(j).

## Appendix.

Claim 1 written by Kenneth Johnson, Applicant.

1. A peep used to view objects or targets comprising:
    - a. three or more slots,
    - b. each said slot having one open end,
    - c. said slots being shaped such that light diffraction is confined within said slots,
    - d. said slots arranged around an open space with said open ends defining the perimeter of said open space, and
    - e. said peep made in a rigid material,
- whereby said peep's aperture will be free of shortcomings caused by diffracted light.

The following claims were written by Janet Schafer  
of Schafer law office.

15. A slotted peep, for use to view objects or targets comprising;
  - a) a housing having at least three slots formed therein, each of said at least three slots having an open end and a closed edge connected by a pair of side edges, said at least

three slots are arranged relative to each other such that a central aperture is defined by interconnection of said open ends of said at least three slots; and

b) means to confine diffraction of light passing through said slots whereby said central aperture is relatively free of diffracted light.

16. The slotted peep of claim 15, wherein said means to confine diffraction of light further comprises forming said edges as thin as practical causing light passing therethrough to diffract perpendicularly to all said edges.

17. The slotted peep of claim 16, wherein said side edges further comprise formation of sharp corners such that diffracted light is directed away from said central aperture leaving said central aperture relatively free of diffracted light.

18. The slotted peep of claim 17, wherein said housing is of ridged construction.

19. The slotted peep of claim 17, wherein said at least three slots further comprise any geometric shape such that any diffracted light is directed away from said central aperture.

20. The slotted peep of claim 19, wherein said closed edge of said at least three slots is curved.

21. The slotted peep of claim 17, wherein said central aperture, has no physical edge to cause light to diffract.

22. The slotted peep of claim 21, wherein each of said at least three slots is provided of a length to prevent any light diffracted by said closed edge of said slot from affecting the space above said series of paired points.

23. The slotted peep of claim 22, wherein said slotted peep performs under all light conditions.

24. The slotted peep of claim 22 wherein providing greater number of slots enlarges said central aperture.

25. The slotted peep of claim 22, wherein providing said at least three slots of greater width enlarges said central aperture.

26. A slotted peep, for use to view objects or targets comprising;

- a) a housing having at least three slots formed therein, each of said at least three slots having an open end and a closed edge connected by a pair of sides edges, said edges causing light passing therethrough to diffract perpendicular to said side edges,
- b) said edges being as thin as practical; and
- c) said at least three slots are arranged relative to each other such that said side edge form sharp corners such that a central aperture is defined by interconnection of said open ends of said at least three slots whereby diffracted light is directed away from said central aperture leaving said central aperture relatively free of diffracted light.

27. The slotted peep of claim 26, wherein said housing is of ridged construction.

28. The slotted peep of claim 26, wherein at least three slots further comprise any geometric shape such that any diffracted light is directed away from said central aperture.

29. The slotted peep of claim 28, wherein said closed edge of said at least three slots is curved.

30. The slotted peep of claim 28, wherein said central aperture, has no physical edge to cause light to diffract.

31. The slotted peep of claim 30, wherein each of said at least three slots is provided of a length to prevent any light diffracted by closed edge of said slot from affecting the space above said series of sharp corners.

32. The slotted peep of claim 31, wherein said slotted peep performs under all light conditions.

33. The slotted peep of claim 26, wherein providing greater number of slots enlarges said central aperture.

34. The slotted peep of claim 32, wherein providing said at least three slots of greater width enlarges said central aperture.

The following claims were written by Larry Nawrocki and Jeffery Cameron

of Nawrocki, Rooney & Siverson, P.A.

17. The slotted peep of claim 34 wherein said member is of rigid construction.
19. The slotted peep of claim 34 wherein said closed end of each of said slots is curved.
23. The slotted peep of claim 34 wherein providing a greater number of slots defines a larger central aperture.
26. The slotted peep of claim 37 wherein providing a greater number of slots enlarges said central aperture.
28. **(Twice Amended)** The slotted peep of claim 37 wherein said closed end of each of said slots is curved.
34. **(Twice Amended)** A slotted peep for use in viewing an object, comprising;
  - (a) a generally planar member having slots formed therein, each of said slots having a pair of generally parallel sides, and an open end and a closed end defining a length of said slot therebetween, each of said slots intersecting angularly spaced adjacent slots at open ends thereof to define a central aperture at an intersection of said slots, each of said slots being paired with another slot to form a slit comprising two slots including two closed ends, and said central aperture;
  - (b) wherein the ratio of the length of said slit and the width of said central aperture is at least 6 to 1.
35. The slotted peep of claim 34 wherein said slots are generally equi-angularly spaced.
36. **(Three Times Amended)** The slotted peep of Claim 35 wherein the edges of said pair of generally parallel sides and the edge of said closed end define a border of a respective slot, and wherein the thickness of said member at said edges defining said border is less than the thickness of said member away from said border.

37. (**Three Times Amended**) A slotted peep for use in viewing an object, by minimizing diffracted light, comprising:

- (a) a generally planar member having slots formed therethrough, each of said slots having a pair of generally parallel sides, and an open end and a closed end defining a length of said slot therebetween, each of said slots intersecting angularly spaced adjacent slots at open ends thereof to define a central aperture at an intersection of said slots, each of said slots being paired with another slot to form a slit comprising two slots including two closed ends, and said central aperture;
- (b) wherein the ratio of the length of said slit and the width of said central aperture is at least 6 to 1 and wherein each said closed end being shaped such that light diffracted from an end of each slot is generally angled in a non-parallel direction with respect to said side edges of the respective slot.

38. The slotted peep of claim 37 wherein said border defines a knife edge.

39. (**Twice Amended**) A slotted peep for use in viewing an object, by minimizing diffracted light, comprising: a member having an outer edge and having slots formed therethrough, each of said slots having a pair of generally parallel sides, and an open end and a closed end defining a length of said slot therebetween, each of said slots intersecting angularly spaced adjacent slots at open ends thereof to define a central aperture at an intersection of said slots and each said side of said slots intersecting a side of another intersecting slot, thereby forming a corner, each said closed end being shaped such that light diffracted from said end is angled in a non-parallel direction to said sides adjacent said end, said member being constructed having a thickness of said member at said corners being less than a thickness of said member away from said corner and wherein each of said slots is paired with another slot to form a slit comprising two slots including two closed ends, and said central aperture, wherein the ratio of the length of said slit and the width of said central aperture is at least 6 to 1.

40. (**Twice Amended**) The slotted peep of Claim 34 wherein each said side of said slots intersect a side of another slot thereby forming a corner, wherein a thickness of said member at said corner of said sides is less than a thickness of said member away from said corner.

41. The slotted peep of Claim 37 wherein said closed ends each have a curved shape.

42. (**Twice Amended**) The slotted peep of Claim 37 wherein said closed ends have a shape that directs diffracted light away from said central aperture.

44. (**Twice Amended**) A slotted peep for use in viewing an object, by minimizing diffracted light, comprising:

- (a) a generally planar member having slots formed therethrough, each of said slots having a pair of generally parallel sides, and an open end and a closed end defining a length of said slot therebetween, each of said slots intersecting angularly spaced adjacent slots at open ends thereof to define a central aperture at an intersection of said slots, each of said slots being paired with another slot to form a slit comprising two slots including two closed ends, and said central aperture, wherein the ratio of the length of said slit and the width of said central aperture is at least 6 to 1; and
- (b) each said side of said slots intersecting a side of another slot thereby forming a corner, wherein a thickness of said member at said corner of said sides is less than a thickness of said member away from said corner.

Please add the following new claim:

45. The slotted peep according to claim 34, wherein said central aperture is 1 mm wide and said each said slot is at least 2.5 mm in length, including the length of said side and said end.

# PHYSICS

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Principles with Applications

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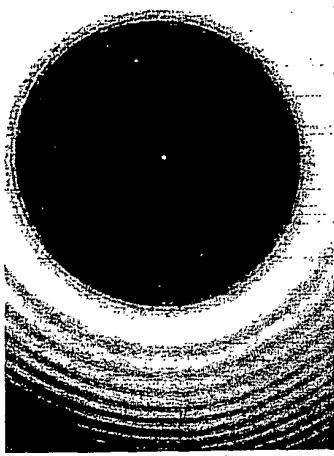
THIRD EDITION

Douglas C. Giancoli

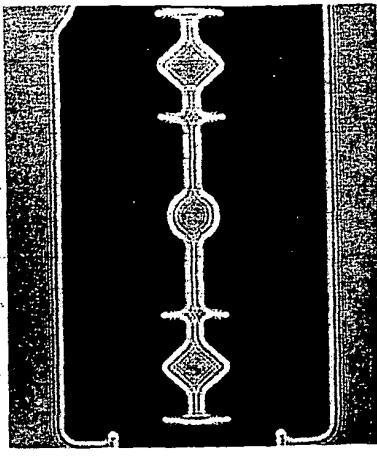
*Exhibit 7*



PRENTICE HALL, ENGLEWOOD CLIFFS, NEW JERSEY 07632



(a)



(b)



(c)

**FIGURE 24-15** Diffraction pattern of (a) a penny, (b) a razor blade, (c) a single slit, each illuminated by a nearly point source of monochromatic light.

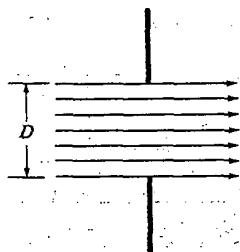
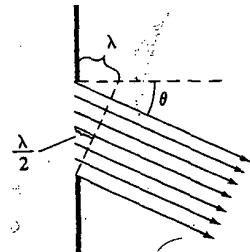
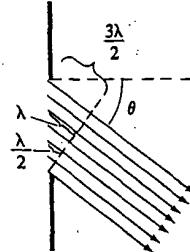
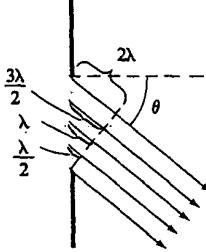
Every day light washes out pattern by not diffraction.

present at the center. Note that there also are bright and dark fringes beyond the shadow. These resemble the interference fringes of a double slit. Indeed, they are due to interference of waves diffracted around different parts of the disk, and the whole is referred to as a **diffraction pattern**. A **diffraction pattern exists around any sharp object illuminated by a point source, as shown in Figs. 24-15b and c**. We are not always aware of them because most sources of light in everyday life are not points, so light from different parts of the source washes out the pattern.

To see how a diffraction pattern arises, we will analyze the important case of monochromatic light passing through a narrow slit. We will assume that parallel rays (or plane waves) of light fall on the slit of width  $D$  as shown in Fig. 24-16. If the viewing screen is infinitely far away, or a lens is placed behind the slit to focus parallel rays on the screen, the diffraction pattern is called **Fraunhofer diffraction**. If the screen is close and no lenses are used; it is called **Fresnel diffraction**. The analysis in the latter case is rather involved, so we consider only the case of Fraunhofer diffraction. As we know from studying water waves and from Huygens' principle, the waves passing through the slit spread out in all directions. We will now examine how the waves passing through different parts of the slit interfere with each other.

Since the screen is assumed to be very far away, the rays heading for any point are essentially parallel. First we consider rays that pass straight through as in Fig. 24-16a. They are all in phase, so there will be a central

**FIGURE 24-16** Analysis of diffraction patterns formed by light passing through a narrow slit.

(a)  $\theta = 0$   
Bright(b)  $\sin \theta = \frac{\lambda}{D}$   
Dark(c)  $\sin \theta = \frac{3\lambda}{2D}$   
Bright(d)  $\sin \theta = \frac{2\lambda}{D}$   
Dark